**Table S2. Disease related mutants in S-OPA1. Data was obtained from UniProt (**[**https://www.uniprot.org)**](https://www.uniprot.org))**.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Optic atrophy 1 (OPA1)** | | | | |
| Position(s) | Mutant | Domain (Predicted) | Description | Reference |
| 8 | A → S | G domain | Unknown pathological significance. | (1) |
| 38 – 43 | Missing | G domain |  | (2) |
| 80 | Y → C | G domain |  | (1) |
| 95 | T → M | G domain |  | (3) |
| 102 | Y → C | G domain |  | (3) |
| 270 | E → K | G domain |  | (4) |
| 272 | L → P | G domain |  | (5) |
| 273 | D → A | G domain |  | (4) |
| 290 | R → Q | G domain |  | (4, 6-8) |
| 290 | R → W | G domain |  | (4) |
| 293 – 294 | Missing | G domain |  | (3) |
| 300 | G → E | G domain | Loss of GTPase activity; loss of function in promoting mitochondrial fusion. | (8-10) |
| 310 | Q → R | G domain |  | (3) |
| 324 – 326 | Missing | G domain |  | (11) |
| 330 | T → S | G domain |  | (12) |
| 357 | A → T | G domain | In DOA+ and OPA1. | (3, 13) |
| 377 | V → I | G domain |  | (12) |
| 382 | I → M | G domain | In OPA1 and BEHRS. | (3, 14, 15) |
| 384 | L → F | G domain |  | (8) |
| 396 | L → P | G domain |  | (3) |
| 396 | L → R | G domain |  | (2) |
| 400 | P → A | G domain |  | (16) |
| 429 – 430 | Missing | G domain |  | (3) |
| 430 | N → D | G domain |  | (3) |
| 432 | Missing | G domain |  | (2, 7) |
| 438 | D → V | G domain |  | (4) |
| 439 | G → V | G domain | In DOA+ and OPA1; decreased GTPase activity; loss of function in promoting mitochondrial fusion. | (10, 13, 17) |
| 445 | R → H | G domain | In DOA+ and OPA1; decreased GTPase activity; loss of function in promoting mitochondrial fusion. | (10, 13, 18-20) |
| 449 | T → R | G domain |  | (3) |
| 459 | G → E | G domain |  | (21) |
| 463 | I → IFIF | G domain |  |  |
| 468 | K → E | G domain |  | (4) |
| 470 | D → G | G domain |  | (5) |
| 487 | E → K | G domain | In OPA1 and BEHRS. | (3, 14) |
| 503 | T → K | G domain |  | (2, 8) |
| 505 | K → N | G domain |  | (8) |
| 545 | S → R | Middle | In DOA+ and OPA1; decreased GTPase activity; loss of function in promoting mitochondrial fusion. | (3, 10, 13, 18, 22) |
| 551 | C → Y | Middle | In OPA1 and DOA+. | (3, 23) |
| 551 | Missing | Middle |  | (4) |
| 571 | R → H | Middle |  | (2) |
| 574 | L → P | Middle |  | (5) |
| 586 – 589 | Missing | Middle |  | (2) |
| 590 | R → Q | Middle |  | (3) |
| 590 | R → W | Middle |  | (11) |
| 593 | L → P | Middle |  | (3) |
| 593 | Missing | Middle |  | (24) |
| 646 | S → L | Middle |  | (3) |
| 700-701 | Missing | EMB |  | (5) |
| 728 | N → K | EMB | Loss of function in promoting mitochondrial fusion. | (10, 11) |
| 768 | G → D | EMB |  | (3) |
| 781 | R → W | EMB |  | (3) |
| 785 | Q → R | EMB | Loss of lipid binding and partial loss of function in promoting mitochondrial fusion. | (4, 6, 10) |
| 823 | S → Y | EMB |  | (3) |
| 841 | Y → C | EMB |  | (1) |
| 882 | R → L | EMB |  | (3) |
| 887 | L → P | EMB |  | (3) |
| 910 | Missing | EMB |  | (21) |
| 932 | R → C | EMB |  | (3, 25) |
| 939 | L → P | EMB | Impairs protein folding; loss of function in promoting mitochondrial fusion. | (6, 10) |
| 949 | L → P | EMB |  | (3, 18) |
| **Dominant optic atrophy plus syndrome (DOA+)** | | | | |
| 357 | A → T | G domain | In DOA+ and OPA1. | (3, 13) |
| 439 | G → V | G domain | In DOA+ and OPA1; decreased GTPase activity; loss of function in promoting mitochondrial fusion | (10, 13, 17) |
| 445 | R → H | G domain | In DOA+ and OPA1; decreased GTPase activity; loss of function in promoting mitochondrial fusion | (10, 13, 18-20) |
| 449 | T → P | G domain |  | (26) |
| 545 | S → R | Middle | In DOA+ and OPA1; decreased GTPase activity; loss of function in promoting mitochondrial fusion. | (3, 10, 13, 18, 22) |
| 551 | C → Y | Middle | In OPA1 and DOA+. | (3, 23) |
| 582 | Y → C | Middle |  | (26) |
| 910 | V → D | GED | Impairs protein folding; loss of function in promoting mitochondrial fusion. | (10, 13) |
| **Behr syndrome (BEHRS)** | | | | |
| 382 | I → M | G domain | In OPA1 and BEHRS | (3, 14, 15) |
| 402 | V → M | G domain | In BEHRSl. | (27) |
| 487 | E → K | G domain | In OPA1 and BEHRS. | (3, 27) |
| **Mitochondrial DNA depletion syndrome 14, cardioencephalomyopathic type (MTDPS14)** | | | | |
| 534 | L → R | Middle |  | (28) |

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